

# Geology Of Lake Hope State Park



Price, 25 cent



STATE OF OHIO  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY  
RALPH J. BERNHAGEN, CHIEF

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# THE GEOLOGY OF LAKE HOPE STATE PARK

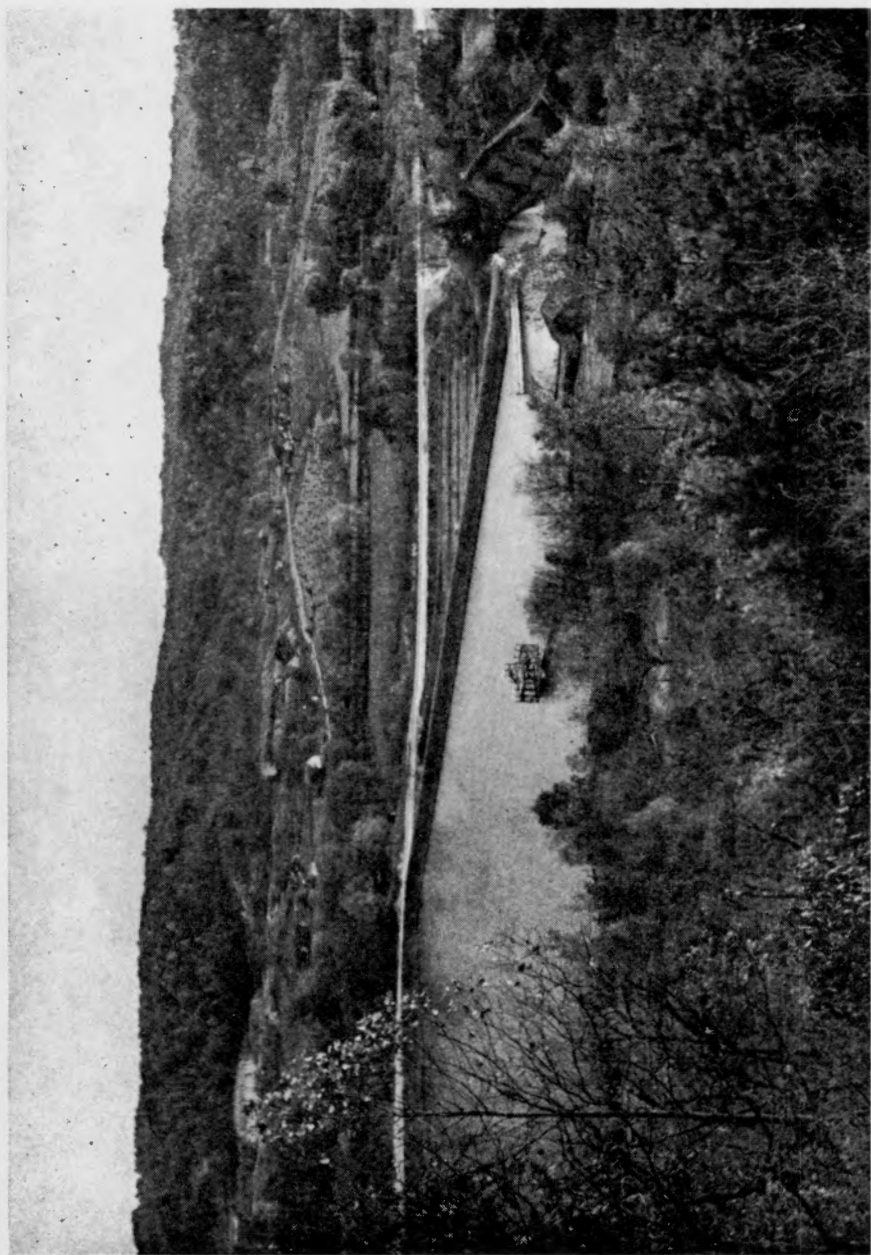
by  
MILDRED FISHER MARPLE

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*Frontispiece. The dam and swimming area as seen from the hill. The strip mine in the Clarion clay is across Racoon Creek valley on the left. The road in the center is Route 278, at the level of the pre-glacial Zaleski Creek. The heavy sandstone exposed along the spillway at the right is the Clarion sandstone.*





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# The Geology of Lake Hope State Park

## THE LAKE

Lake Hope lies in the valley of Sandy Run in the Zaleski State Forest. This is a wilderness area of 17,865 acres in Brown Township in the northeastern corner of Vinton County. Zaleski, the nearest town, is four miles distant, at the junction of State Routes 677 and 278. Easily accessible from Routes 50, 56, and 75, the lake is eight miles from McArthur, 31 miles from Chillicothe, 28 miles from Athens, and 23 miles from Logan. (Figure 1)

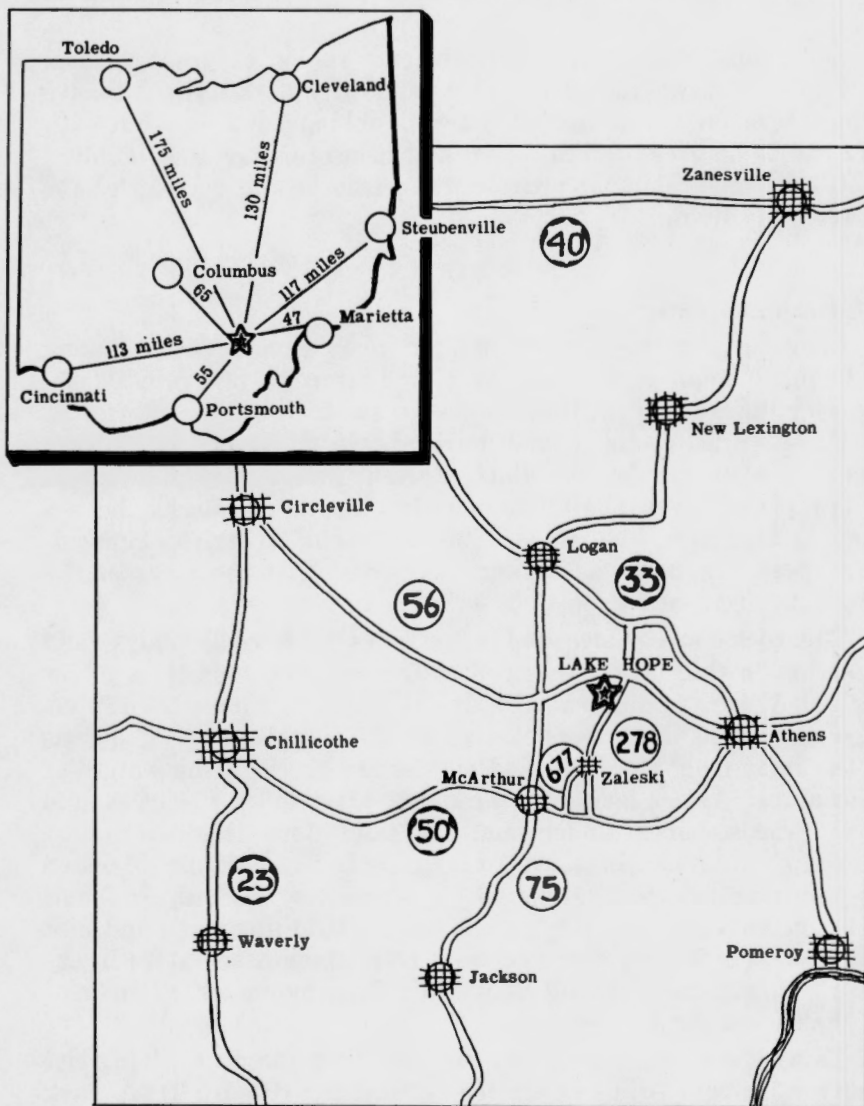


Figure 1. Map of southeastern Ohio showing the location of Lake Hope State Park.



The 120-acre lake was built by the Resettlement Administration in cooperation with the Division of Forestry of the Ohio Agricultural Experiment Station which acted as the sponsoring agency. The greatest depth is 24 feet and the surface of the water is 715 feet above the sea. One thousand five hundred and fifty acres of the forested hills has been set aside and developed as a recreation area with hundreds of picnic tables, a bathing beach, and a boat house. Camping sites, housekeeping cabins, and sleeping cabins offer vacation opportunities and meals may be had at the Dining Lodge.

Lake Hope Park is in the heart of a region of great natural beauty. It is also a region of great mineral wealth. The hills are mighty storehouses crammed,—not with gold and jewels,—but with other riches of great worth,—coal and iron ore, clay, and building stone,—the minerals that provide the comforts and necessities for our everyday living.

## THE ROCKS

### *Historically speaking*

Long ago,—more than 200 million years ago, in fact,—during the Pennsylvanian period, eastern North America presented a picture very different from that which we see today. The interior of the United States was a vast lowland. Great rivers meandered through the swamp forests which stretched mile after mile across the low plain. Even slight changes in elevation brought the sea water flooding over wide areas. This was Ohio during the Pennsylvanian period, and it was during this period that the rocks of the Lake Hope area were deposited. (Figure 2)

The rocks are shales and sandstones with coals, clays, and limestones in thin layers that reflect the unstable conditions under which they were laid down. (Figure 3) The clays have been interpreted as the old, leached soils on which the forests grew. The coals are the remains of the trees and plants, preserved in the waters of the swamps. As sea level rose, brackish water killed the trees, and the muckbeds, buried under mud and sand along the shore, were changed by time and pressure to form coal. Sea animals migrated into the more favorable areas where the water was deeper. Their shells, mixed with limy mud, make up the thin limestone and flint layers. Rivers carried mud and sand from their headwaters in the eastern mountains and built deltas and flood plains which are now the shales and sandstones.

This sequence of events was repeated over and over, giving rise to successive coal beds and marine sediments. (Figure 4) At last, great movements of the Earth's crust raised the Appalachian Mountains higher. The sea was drained from Ohio, never to return. The

ERA	PERIOD	EPOCH
CENOZOIC	QUATERNARY	Recent
		Pleistocene (Ice Age)
	TERTIARY	1 million years ago
MESOZOIC	55 million years ago	
	CRETACEOUS	
	JURASSIC	
	TRIASSIC	
PALEOZOIC	161 million years ago	
	PERMIAN	{ MONONGAHELA CONEMAUGH ALLEGHENY { These strata present in Park. POTTSVILLE
	PENNSYLVANIAN	
	MISSISSIPPIAN	
	DEVONIAN	
	SILURIAN	
	ORDOVICIAN	
	CAMBRIAN	
PRE-CAMBRIAN	475 million years ago	
	Subdivisions not established.	

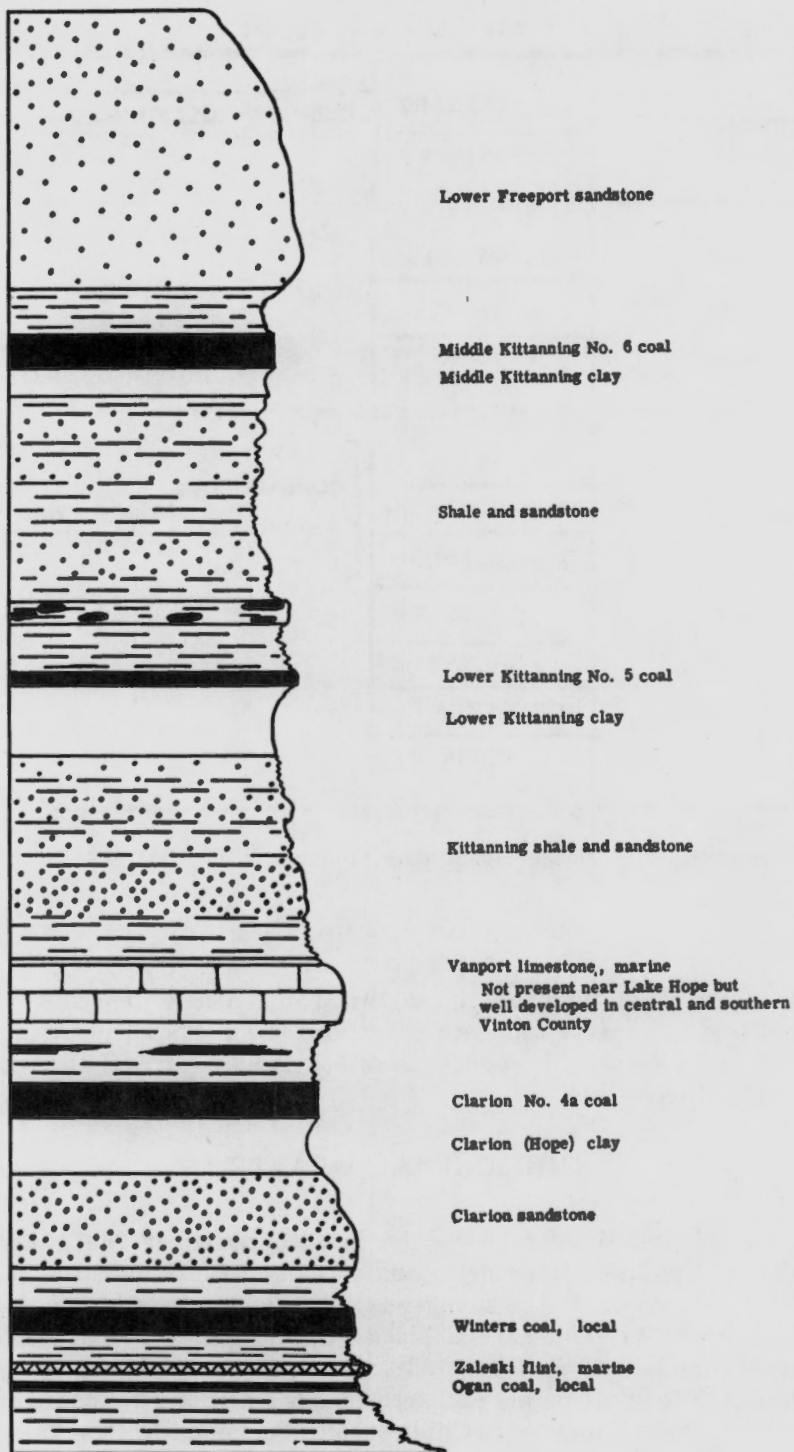
Figure 2. Geologic time chart.

rock layers were tilted gently eastward and a new generation of rivers began to carve valleys and expose the rocks. Thus we are able to see successively younger formations as we travel eastward across southern Ohio.

## THE MINERAL WEALTH

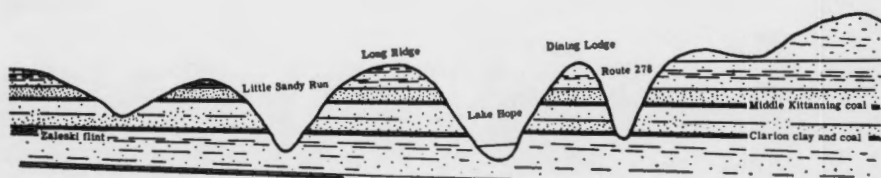
### Flint

The Mound Builders were the first to recognize the mineral wealth of the Lake Hope area, and to exploit it, though the rock which meant riches to the savages is not of wide use in our civilization. (Figure 5) The Zaleski black flint, which crops out northwest of the lake near Route 328, was quarried extensively and fashioned into spear points and arrowheads which are found up and down the Scioto Valley from Chillicothe to Portsmouth. The Zaleski



*Figure 3. Columnar section of rocks in the park region.*





*Figure 4. Geologic cross section of the park region showing how the rock layers dip slightly toward the east.*

flint was deposited under shallow sea water in a comparatively small estuary, but its quality is such that it was the third most important source of material for tools and weapons, not only for the Mound Builders, but for the Indians who followed them.

The flint of the Vanport formation was quarried by the Mound Builders farther north, at Flint Ridge, in Licking and Muskingum counties, but in southern Ohio the Vanport flint tends to be porous which makes it less desirable for arrowheads. The Zaleski black flint, however, is firm and tough.

The rugged hills of Vinton County held little attraction for the pioneer searching for farm land. But in 1805 a mineral resource was discovered that was the basis of an industry which founded the



*Figure 5. Moundbuilder earthwork at Zaleski.*

town of McArthur. Tradition tells us that a Mr. Musselman, whose first name is lost to history, was the discoverer. He was a miller by trade and had come to America from Germany. He recognized that the Vanport formation which crops out in the hills west of McArthur was similar to the famous buhrstone of the Paris Basin in France,—a pure flint rock of open structure, full of tiny cells. Though only Indians lived in the neighborhood, Musselman and his partner, Isaac Pierson, camped out in the woods and quarried the rock which they dressed into millstones. (Figure 6)



*Figure 6. Buhrstone made of flinty Vanport limestone. The porous nature of the flint is well shown after long weathering.*

Musselman moved on the following year but Pierson had found the business so profitable that he built a cabin and hired helpers, and soon there grew up the little settlement called McArthurstown, for Governor Duncan McArthur. In 1814 a pair of 4½ foot millstones was worth \$350. A pair of seven-foot buhrs sold for \$500. Marketed under the name of "Raccoon Millstone" the industry produced a revenue of \$20,000 per year for more than 30 years.

Charlotte Bothwell, one of the early settlers in McArthur, wrote "When we first came here in 1814 there were perhaps 50 families in and around the settlement, most of them quarrying and making millstones. There was no person making a business of farming. All had their patches of garden, but making millstones was their principal business."



*Figure 7. Hope Furnace. The arch over the hearth (right) has fallen. It was here that the iron was drawn off and run into molds. The opening at the left admitted the air blast.*



## Iron

A hundred years ago the Lake Hope region, now so peaceful, was a bustling little Pittsburgh. Processions of wagons creaked along the muddy roads. The charcoal-burner's axe rang in the forest. Zaleski was a thriving industrial town. Today the ruined stack of Hope Furnace is all that is left to remind us of the days when Ohio ores supplied much of the Nation's iron. (Figure 7)

Difficulties in transportation and marketing hampered the early development of the iron industry but the building of the railroads was accompanied by the building of seven blast furnaces in Vinton County between 1853 and 1858. The Hanging Rock Iron District extended from Vinton County southward into Kentucky, and was a center of wealth and activity based on the rich iron ores which crop out in the region and the fuel supplied by the forests.

Each stack was surrounded by its large tract of woodland, for it required about 13,000 cords of wood,—the product of more than 325 acres,—to operate a furnace for a year. Charcoal was made by contractors whose men cut the wood into four-foot lengths which were stacked on end, covered with leaves and wet earth, and burned for 10 to 12 days. Four or five yoke of oxen were needed to pull a wagon-load of 200 bushels of charcoal over the muddy roads to the furnace.



Figure 8. Hecla Furnace. Typical of the charcoal furnaces of the Hanging Rock Iron District. Charcoal, ore and limestone were stored on the hill at the right, and poured into the stack seen under the shed (left-center). Iron was drawn off into molds in the casting shed at the left. (Photo courtesy Wilber Stout).

The furnaces were built of sandstone, near the side of a hill so that the top of the stack was at the level of the sheds where the charcoal, ore, and limestone were stored, and where the engines for the blowers and the stoves for heating the air blast were located. Below, in front of the stack, was the casting house. (Figure 8)

Ore, dug along the hillsides, was hauled by oxen or shipped by rail to the furnaces. Here it was usually built into great piles with layers of the fine charcoal and burned slowly to drive off carbon-dioxide, water, and sulphur. After this treatment many of the ores contained as much as 40 percent iron. Roasted ore, charcoal, and limestone were then fed into the top of the furnace stack and hot air blown in near the bottom. Impurities combined with the melted limestone and floated as a scum of slag on top of the iron. Pieces of the black, glassy slag from Hope Furnace still lie east of the stack where they were dumped long ago.

Hope, or Big Sand Furnace, was built in 1853. The heavy masonry of the outer shell and retaining walls came from the sandstone which crops out higher up the hill behind the furnace above the Middle Kittanning coal. The original lining and hearth were built from the Clarion sandstone. Later a firebrick lining was installed. The location, in the midst of 4,000 acres of virgin timber, on Sandy Run, was chosen because of the fuel supply, and, as they thought adequate ore. However, the local supply proved disappointing, so limestone and ore were brought in by rail and pig iron shipped out on a spur track which followed the present Route 278 from Hope Station on the Baltimore and Ohio Railroad. Hope Furnace was charged with 2,400 pounds of roasted ore, 140 pounds of limestone, and 70 bushels of charcoal. Production was about 15 tons per day, requiring 140 bushels of charcoal per ton of iron.



*Figure 9. View of Zaleski from the site of "Zaleski Castle".*

Zaleski Furnace, which stood just north of the town, was named for Peter Zaleski, a Paris banker, who was the financial agent for wealthy Polish exiles in France. He was a leading member of the Zaleski Mining Company which purchased a large tract of land and laid out the town of Zaleski in 1856. In 1859 Francis J. Hazeltine assumed management of the furnace and built the imposing house called "Zaleski Castle" on the hill overlooking the town. (Figure 9) Surrounded by gardens, "The Castle" was the show place and scene of the gatherings of the social elite of the neighborhood. Today nothing remains. Even the bricks have crumbled to dust.

The blast furnaces of the Hanging Rock District could smelt iron faster than they could sell it. Surplus iron was stored and script issued with which to pay the men. (Figure 10) Script was good in trade at the "company store," the only shopping center near. Profits at the store sometimes ran as high as 60 percent, which helped balance the sheet, but for eight years before the Civil War nearly all the furnace owners were in debt. Iron was worth about \$10 a ton.

The war changed the picture. Ohio's charcoal iron was found to be unsurpassed for casting heavy cannon and the demand and price rose rapidly. Iron came out of storage at \$40 a ton and by 1864 the price had gone to \$80 a ton. But the war boom ended. The forests were exhausted. The iron industry shifted to Lake Superior ores smelted with coke, and the blast furnaces of the Hanging Rock Iron District gradually fell into decay.



*Figure 10. Script used to pay iron workers in the early days.  
(Photo. courtesy Wilber Stout)*



## *Clay*

Early settlers were quick to see the high quality of the native clays and small shops were established where stoneware crocks and jugs were turned by hand on the potters wheel and burned in small kilns, using wood for fuel. (Figure 11)

With the opening of the brick plant at McArthur in 1905 the modern ceramic industry of the county was established. Using mixtures of several local shales and clays this factory can produce 24 million high quality face brick per year, enough to build a wall more than five feet high entirely around Vinton County.

Across Raccoon Creek Valley from Lake Hope the hills are scarred by a large strip mining operation. This is the level of the Clarion clay and coal, some of the most valuable rock layers in the Lake Hope area. (Figure 12) Here the clay is mined and under the name of the "Hope Fire Clay" is widely marketed for the manufacture of bricks capable of withstanding high temperatures. The clay has a total thickness of eight feet. The middle portion of this is of high quality, and a light gray color. The clay was stripped around the hills until the cover became too heavy for economical removal. An entry was then driven into the side of the hill and the clay is now mined just as coal is mined, by a room and pillar system.



*Figure 11. Gill Earnheart's Pot Shop on Potter's Ridge.  
(Photo. courtesy Wilber Stout.)*



*Figure 12. Portal of clay mine at Hope Station. The entrance is at the level of the Clarion (Hope) clay. Above the clay is the Clarion No. 4a coal. Heavy sandstone forms the roof of the coal here, in the place occupied by the Vanport limestone farther south.*

Nearly a third of the clay must be left in the mine as pillars to support the roof which is formed by the Clarion coal.

The Clarion, or Hope, clay crops out in many places along Route 278 between Zaleski and Lake Hope. It is easily recognized by its white color with the black "coal blossom" above it marking the horizon of the Clarion coal.

### *Coal*

Coal has long been mined and used locally as domestic fuel. The big market came with the building of the railroads shortly before the Civil War. Today, a little more than half of the 350,000 tons mined annually in Vinton County is shipped by rail and about half by truck. Much of the coal is mined in comparatively small operations, owned, managed, and worked by local individuals.

Two important coal beds crop out in the Lake Hope area;—the Clarion No. 4a and the Middle Kittanning No. 6.

The first of these is well seen in the bank above Route 278 east of the lake and between Lake Hope and Zaleski. The Clarion coal is

as much as four feet thick in southern Vinton County but near Lake Hope it has only half that thickness. It is mined extensively by stripping and many of these operations can be seen along Route 50 east of McArthur where both coal and clay have been removed. In addition to the greater safety of this method of mining, much valuable fuel is recovered from a bed too thin for profitable underground working. (Figure 13)



*Figure 13. A reclaimed spoil bank, planted with maples, locusts, oaks and other hardwood trees.*

Where the Vanport limestone lies above the Clarion coal a few miles west and south of Lake Hope, the spoil banks of the strip mines are soon covered with a growth of sweet clover and locust trees which seed themselves naturally where the soil is sweet enough. On the old strippings just east of McArthur "volunteer" vegetation is returning. Modern coal operators have long range programs for the profitable use of their land and prepare for the return of their spoil banks to forests or pastures. One company has planted nearly half a million locusts, pines, and maples on the land north of McArthur from which they have removed the coal.

The spoil banks near Lake Hope, however, are barren,—for two reasons, one natural, the other man-made. First the limestone is wanting. Millions of years ago a great river swept sand over the Clarion coal swamp while limy sediments were accumulating both to the north and south. The heavy sandstone thus formed is well exposed above the coal along Route 278 near Hope Furnace. Second, the coal is not always removed in clay mining. Coal thrown into the spoil banks is high in sulphur which combines with rain water to form sulphuric acid which prevents the growth of plants. Restoration of these banks must wait until the soil is leached enough for plant life to survive.

The Middle Kittanning coal is one of the most widespread coal beds in Ohio and is the most important fuel reserve in Vinton County. It lies about 80 feet above the Clarion coal and can be seen cropping out along Route 278 north of Lake Hope where it has been opened at several places. (Figure 14) North of the lake this coal is being actively mined today, but there are also many old workings in the hollow north of the Ohio State University Civil Engineering



*Figure 14. Drift mine in the Middle Kittanning coal north of Lake Hope. The mine entrance is at the level of the coal in the hillside at the left. A cable reel hauls the loaded cars out to the tippie where the coal is dumped into trucks at the right. In the right foreground are the scales for weighing the loads.*



Camp, which are relics of the days when Zaleski was a booming railroad town.

The coal lies in three benches separated by clay and shale partings. The average thickness of the clean coal in the middle bench is 3 feet 8 inches and in the lower bench, 2 feet 9 inches. The upper bench is about 7 inches thick, but is of inferior quality. A few plant fossils may be found in the bony shale at the top of the coal. The heavy sandstone above the coal forms a prominent cliff along Route 278.

On the hillside above old Hope Furnace stack the Middle Kittanning coal was mined long ago. The old piles of waste and slack coal remain today to mark the spot, for plants will not yet grow on such acid material. The water, draining from the mines, is acid too, but a filter bed of crushed limestone has been placed in Sandy Run to neutralize the acid and protect the fish and plant life of Lake Hope.

### *Sandstone*

Some of the local sandstones have been used in bridges and in the stacks of the old iron furnaces, but most of the sandstone used



*Figure 15. Ripple marks on the sandstone caps of the gutter drains were made by waves when the stone was soft mud on the bottom of the sea.*

in Lake Hope Park structures is of Mississippian age, several million years older than the bedrocks of the park region. (Figure 15) The mottled buff and brown stone seen in the Dining Lodge, shelter houses, and in the cabin chimneys is from the Berea sandstone formation, quarried southwest of Chillicothe. This stone is prized for its beauty and durability and is widely used throughout eastern United States. Some of the flagstones in the walks and the covers of the gutter drains along the roads are of ripple-marked Berea sandstone. When the sand was being deposited in the sea, long ago, little waves made ripples, just as we see them on the beach today. These were preserved when the sand was cemented into hard rock.

Some of the smooth, gray flagstones in the terrace at the Dining Lodge are Buena Vista sandstone, also of Mississippian age although slightly younger than the Berea. This stone has been quarried for many years at McDermott, in Scioto County west of Portsmouth. (Figure 16)



*Figure 16. The walls of the Dining Lodge are built of Berea sandstone, quarried near Chillicothe. The smooth, gray flagstones and the capping of the retaining wall are Buena Vista sandstone, quarried at McDermott.*

## *Oil and Gas*

Small amounts of oil and gas have been produced from about a dozen wells just north of Zaleski. Here the Berea sandstone which is in the tops of the hills west of Chillicothe has been carried down by the eastward dip of the rocks until, near Lake Hope, it is a thousand feet below the surface and is the reservoir from which the oil is obtained. The major oil and gas fields of Vinton County, however, lie farther to the west and south.

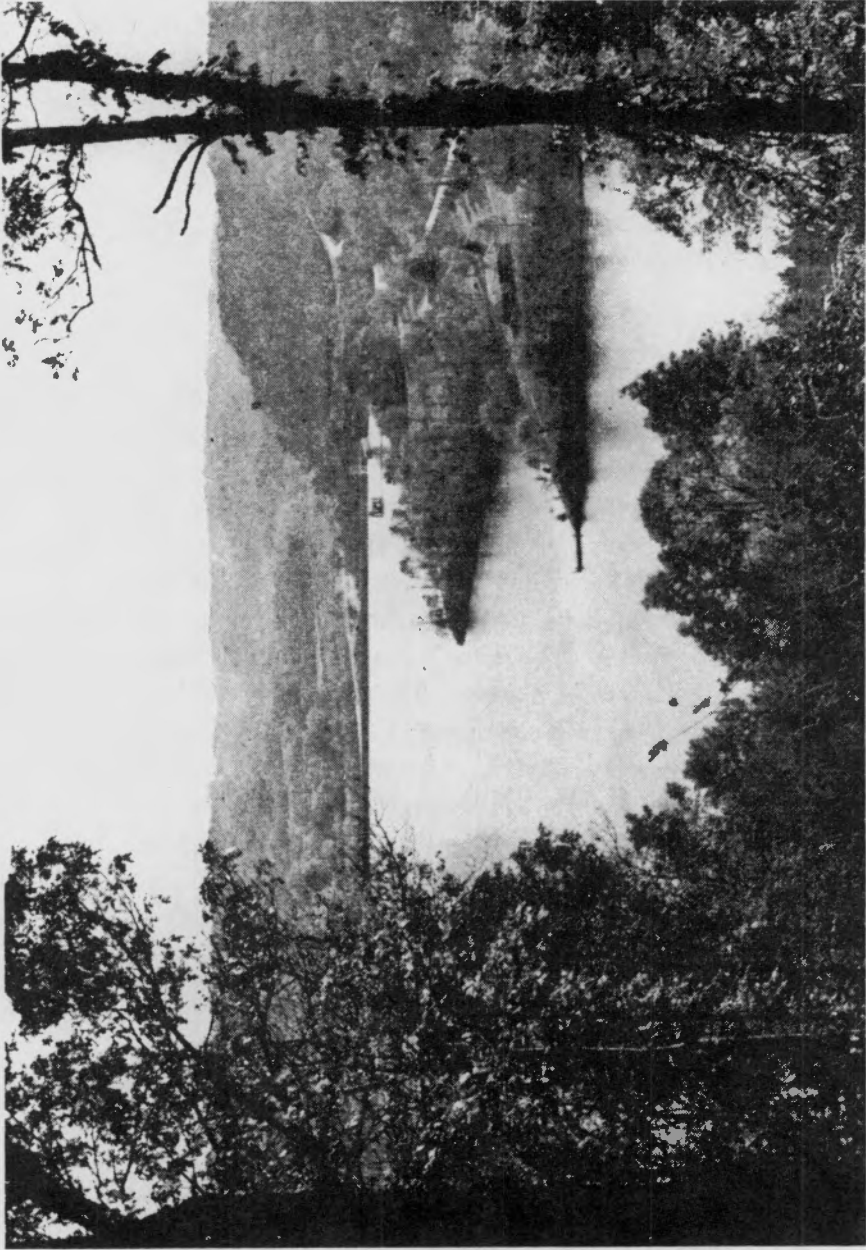
## THE HILLS

### *The Plateau*

As you stand on the Lookout at the Cemetery Picnic area and gaze across the lake,—or as you look down the lake from the Dining Lodge to the hills beyond,—you see ridge after ridge fading to the distant horizon. (Figure 17) Look then at the valleys. If all the dirt and rocks which have been washed away by the streams could be restored, and the valleys filled again, the region would be a gently rolling plain sloping a little to the south. This is the Allegheny Plateau. Because the streams have cut such extensive valleys we call it a *maturely dissected plateau*. The Allegheny Plateau is one of the major physiographic provinces of eastern United States. It extends eastward into Pennsylvania, New York, and West Virginia and the western boundary is the Mississippian escarpment, the line between the hilly country of southeastern Ohio and the level plains of the western part of the State.

### *The Peneplains*

Near the end of the Paleozoic era (See Figure 2) the rocks of eastern North America were slowly folded and the Appalachian Mountains were made. During the Mesozoic era the mountains were worn down until the area had been reduced to a lowland called a *peneplain*. Slowly, the plain was warped and uplifted. The movement at any one time was never great and the streams were able to cut down the land nearly as fast as it rose. A second plain developed on which remnants of the older, higher plain were left standing as hills, called *monadnocks*. The high knobs east of



*Figure 17. View of Lake Hope from the Dining Lodge. Note the level sky-line and the bench on the right where the picnic shelter stands.*



Chillicothe, which are pictured on the great seal of Ohio, have been interpreted as monadnocks,—relics of the first plain.

The second plain is called the Harrisburg surface because of its prominence near Harrisburg, Pennsylvania. In the Lake Hope area the tops of the highest ridges, such as the Fire Tower Hill near Zaleski, all attain an elevation of about 1,050 feet. These are fragments of the Harrisburg plain. (Figure 18)

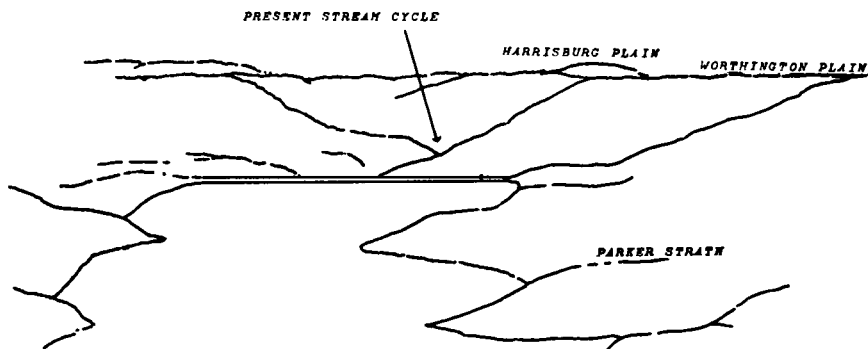


Figure 18. Sketch drawn from the photograph in Figure 17. The highest hilltops are at the level of the Harrisburg Plain. Most of the skyline represents the Worthington Plain. The picnic area along the west shore is on the Parker Strath. Raccoon Creek valley is being cut during the present stream cycle.

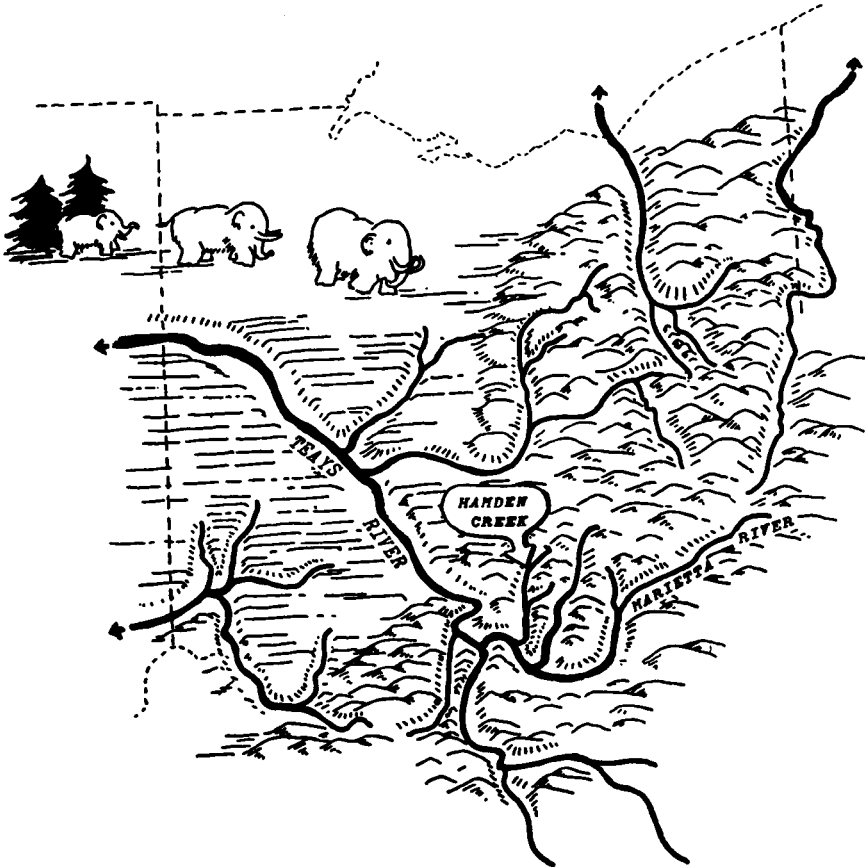
The land was again raised slightly in late Tertiary time and the streams began a new cycle of erosion, cutting downward and then widening their valleys, to create yet another peneplain, the Worthington plain. Remnants of the Harrisburg plain stood upon it as ridges about 100 feet high. Before the Worthington peneplain could be completed there came still another period of slow uplift and the streams began to cut down actively again. They made fine, broad valleys more than 200 feet deep, with many tributaries, so that the Worthington surface was cut up and left as a series of ridges whose summits now stand at an elevation of about 960 feet.

The ridge-top picnic areas,—Cemetery, Piney Point, Wildcat, and Lake Ridge,—the vacation cabins, sleeping cabins and Dining Lodge,—all are about 960 feet above the sea, on remnants of the Worthington peneplain.

## THE RIVERS

### *Preglacial drainage*

The river system which dissected the Worthington peneplain in Ohio was very different from the drainage pattern of today. The master stream of late Tertiary time is called the Teays River. (Figure 19) It rose in the Piedmont area of North Carolina and Virginia and flowed northwestward, following the present Ohio Valley from Huntington, West Virginia, to Wheelersburg, Ohio, where it turned northward, past Minford and Beaver to Waverly and Chillicothe. Beyond this point the Teays Valley is buried beneath glacial deposits but it has been traced with more or less



*Figure 19. The Rivers of Ohio about one million years ago, before the glaciers came.*

certainly northwestward into Indiana and is believed to have emptied eventually into the Gulf of Mexico.

Southeastern Ohio was drained by the Marietta River which flowed roughly in the Ohio Valley from Marietta to a point near Gallipolis where it turned northwestward, past Jackson, and united with the Teays near the line between Pike and Jackson counties.

Hamden Creek, a tributary of the Marietta, was the principal stream of eastern Vinton County. Near Dundas it received the waters of Zaleski Creek which rose in the vicinity of Lake Hope.

The valley floors of these old streams, taken collectively, are called the Parker Strath. (Figure 18) A *strath* is the broad rock floor of a valley cut by a river. The Parker Strath is cut more than 200 feet below the level of the Worthington plain.

This, then, was the picture of Ohio in preglacial days:—a hilly country with a few high knobs, some high ridges, some lower ridges;—and all drained by northwestward trending streams, flowing swiftly in deep valleys.

## THE GLACIERS

### *Refrigeration*

About a million years ago the climate of North America became cooler and wetter and a great continental glacier began to form. The ice spread out from a center west of Hudson Bay, covered much of the northern Great Plains, and perhaps reached as far east as Ohio. After some tens of thousands of cool years there came a change to warmer weather. The ice melted away and for about 200 thousand years Ohio enjoyed a climate as warm, or warmer than the present. A second chilling followed, with the formation of another ice sheet, which in turn, melted, only to be followed by a third glacier and a fourth, which melted away only about 20,000 years ago. The first of these ice sheets is called Nebraskan, the second, Kansan, the third, Illinoian, and the fourth Wisconsin. The time from the beginning of the Nebraskan glacier to the melting of the Wisconsin is called the Pleistocene epoch. (Figure 2)

### *Drainage Changes*

None of the Pleistocene glaciers extended into Vinton County, but they left their stamp on the area in the changes which they forced upon the rivers. Some valleys were choked with silt. Some streams were reversed and made to flow in the opposite direction. Some cut new valleys, or appropriated the valleys of other streams. The whole picture was altered.

The westward-flowing preglacial Teays River was blocked by the advancing wall of ice of either the Nebraskan or Kansan glacier and forced to find a new channel along the ice front. Slack water conditions were produced, not only in the main stream, but far up the tributary valleys. As the current was checked, the streams deposited their loads of silt, choking the valleys and still further obstructing the channels.

The ponded waters poured over the low divides between the headwaters of some of the tributary streams. These torrents rapidly cut gorges and established a new drainage pattern which bears little resemblance to the old. The Teays River was gone. The new master stream followed roughly the course of the present Ohio River.

In the Lake Hope area the present day master stream is Raccoon Creek, with its tributaries, Sandy Run, Elk Fork, and Wheelabout Creek. (Figure 20)

During Teays time, before the first advance of the ice, northeastern Vinton County was drained by tributaries of two streams which for convenience have been named Hamden Creek and Albany River. (Figure 20) The west branch of Hamden Creek had its headwaters near Mt. Pleasant and Orland and flowed south, past Creola and Elk Fork through the valley now followed by Route 75. The east branch of Hamden Creek occupied the valley now used by Raccoon Creek south of New Plymouth. This valley extends southwest to Elk Fork where the east and west branches of Hamden Creek formerly united. However, Raccoon Creek now turns southeastward through a new valley to Zaleski, where it swings abruptly northeastward and flows, in a reversed direction, up the valley of the preglacial Zaleski Creek.



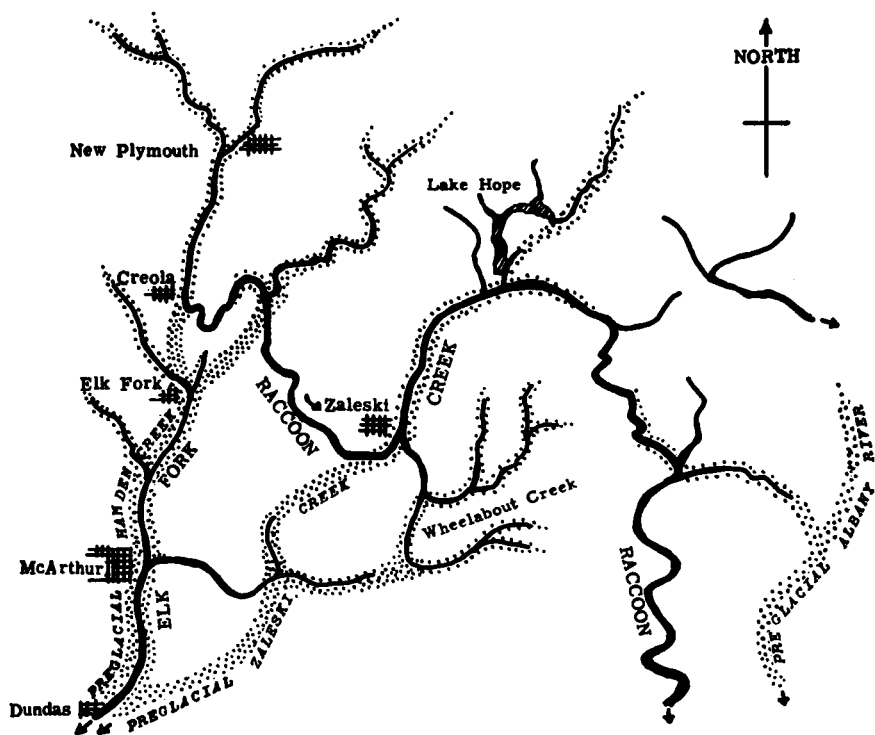


Figure 20. Drainage changes in the Lake Hope area. The pre-glacial streams are shown in a pattern of dots. The present-day streams are solid black lines.

Zaleski Creek followed the present Sandy Run as far as Hope Furnace. Then its course was through the valley now used by Route 278 and occupied in part by the southeastern arm of Lake Hope. Just below the present dam it received a tributary from the east and the augmented stream flowed southwestward. Raccoon Creek has cut this valley deeper. The town of Zaleski stands on a remnant of the old valley floor, or Parker Strath. The terrace occupied by the Ohio State University Civil Engineering Camp and the long promontory which projects far out into the valley at Brewer Cut on the Baltimore and Ohio Railroad also mark the level of the valley floor on which Zaleski Creek flowed.

When you drive along the west side of Lake Hope from the Park entrance to the large picnic shelter near the lake you are at the level of the old valley floor. Many of the roads take advantage of the easy grades and follow the preglacial valleys through the

hills. Most of the farming areas of Vinton County are on these old valley floors.

#### IF YOU WANT TO READ MORE

A detailed account of the geology and the changes in the streams of Vinton County is given by Dr. Wilber Stout in the Ohio Division of Geological Survey, Bulletin 31, The Geology of Vinton County.

An interesting history of early coal mining, by Andrew Roy, and a history of the Hanging Rock Iron District, by Edward Orton, will be found in The Ohio Division of Geological Survey, Volume 5, (1884).